



MARCH 2016

SPACE LAUNCH SYSTEM HIGHLIGHTS



**PRECISION
MEETS
PROGRESS
ON SLS
CONFIDENCE
TANK**

MASSIVE MACHINE COMPLETES FINAL WELDING ON SLS CONFIDENCE LIQUID OXYGEN TANK

A liquid oxygen tank confidence article for [SLS](#) completes final welding on the world's largest spacecraft welding tool, the Vertical Assembly Center, at Michoud Assembly Facility in New Orleans. This is the first glimpse of what one of the two tanks will look like that make up the [SLS core stage](#). Confidence hardware verifies weld procedures are working as planned and tooling-to-hardware interfaces are correct. It will also be used in developing the application process for the thermal protection system, which is the insulation foam that gives the tank its orange color. The liquid oxygen tank is the smaller of the two tanks in the core stage. Components of the [liquid hydrogen tank](#) confidence article completed welding in February at Michoud. All welding for the SLS core stage for the Block I configuration of the rocket -- including confidence, qualification and flight hardware -- [will be done](#) this summer in preparation for its first flight with NASA's Orion spacecraft in 2018. See more progress photos on [Flickr](#).



FINAL HARDWARE DELIVERED FOR SECOND SLS BOOSTER TEST

The fifth and final segment for a full-scale test version of the [SLS](#) booster was delivered March 2 to Orbital ATK's Promontory, Utah, test site. The aft -- or rear -- segment of the booster will be assembled with the other four segments, currently at the test stand, and outfitted for a second booster qualification ground test this summer. The test will measure the booster's performance at a cold motor conditioning target of 40 degrees Fahrenheit and also demonstrate that it meets applicable ballistic requirements. NASA successfully [completed](#) the first booster qualification test in March 2015. The two full-scale tests provide crucial data to support booster qualification for the first two flights of SLS with NASA's [Orion spacecraft](#).

ENGINE TEST MARKS MAJOR MILESTONE ON NASA'S JOURNEY TO MARS

On March 10, NASA successfully tested a SLS RS-25 flight engine at Stennis Space Center near Bay St. Louis, Mississippi. The RS-25 flight engine was tested for 500 seconds and will be used on the first crewed SLS mission. "Not only does this test mark an important step towards proving our existing design for SLS's first flight, but it's also a great feeling that this engine that has carried so many astronauts into space before is being prepared to take astronauts to space once again on SLS's first crewed flight," said Steve Wofford, engines manager at NASA's Marshall Space Flight Center in Huntsville, Alabama.

CREWS 'TOP OUT' FIRST OF TWO NEW SLS TEST STANDS AT NASA MARSHALL

On March 4, crews "topped out" Test Stand 4697, which is under construction to test the [SLS](#) liquid oxygen tank at the Marshall Center. "Topping out" is a builders' rite traditionally held when the last beam is placed on top of a structure during its construction. The 85-foot-tall test stand will use hydraulic cylinders to subject the liquid oxygen tank and hardware of the massive SLS [core stage](#) to the same loads and stresses it will endure during a launch. The tests also will verify the models already in place that predict the amount of loads the core stage can withstand during launch and ascent.



Prime contractor *Brasfield & Gorrie* of Birmingham, Alabama, and several of its subcontractors are constructing Test Stand 4697 and [Test Stand 4693](#).



The beam is positioned in place to "top out" Test Stand 4697.



SLS Deputy Program Manager Jerry Cook, center, and SLS Stages Integration Manager Tim Flores, right, sign their names on the test stand beam.

A large orange and white SLS rocket is the central focus of the image, standing vertically in a large exhibition hall. The rocket is inflated and supported by cables. In the background, other rockets and exhibition booths are visible, including one with a 'MARS' sign and a NASA logo. People are seen in the foreground, looking at the rocket.

SLS *at* SOUTH BY SOUTHWEST

South by Southwest (SXSW) is said to be the premier destination for discovery. With NASA embarking on its own missions of discovery and exploration, the SXSW event was a great place to share information about the agency's goals and initiatives, including the journey to Mars. Throughout the week, some 10,000 SXSW participants got a first-hand look at interactive exhibits and displays, including a virtual tour of the launch pad with SLS on the mobile launcher and snagging the perfect photo op with the 30-foot inflatable of the rocket. NASA Astronauts Victor Glover and Jessica Meir stopped by the booth to greet fans and sign autographs. They also took part in a standing-room-only panel discussion about next steps on the journey to Mars, which concluded with a standing ovation. NASA at SXSW was featured in several media publications, including AdWeek and The Austin Chronicle.

Event goers take a look at the 30-foot SLS inflatable.

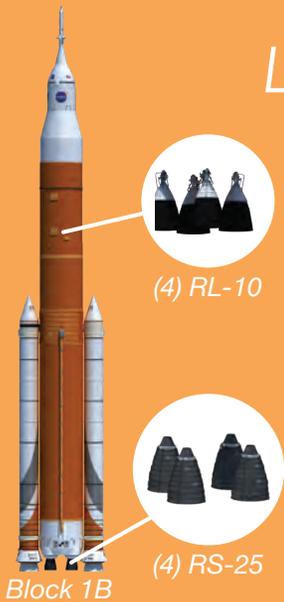


On the journey to Mars panel is, from left, NASA Astronaut Jessica Meir; NASA Astronaut Victor Glover; Nujoud Merancy, Orion Mission Planning lead; Chris Crumbly, Spacecraft/Payload Integration and Evolution manager; and Yves Lamothe, lead systems engineer for the Ground Systems Development and Operations Program.



A NASA fan taking a virtual tour of the launch pad with SLS.

SPACEFLIGHT PARTNERS: LeFiell Manufacturing Company



LOCATION:
Santa Fe Springs, California

NUMBER OF EMPLOYEES: 105

LeFiell produces tapered metal tubes that are used to build thrust chambers for both the RS-25 engines that will help power the SLS core stage and the RL-10 engines that are slated for use on the SLS Block 1B Exploration Upper Stage.

Super-cooled, cryogenic liquid hydrogen flows through the tubes to help keep the thrust chambers cool before it is mixed with liquid oxygen and burned in the combustion chamber to produce thrust. Each RS-25 engine contains 1,080 coolant tubes, and each RL-10 engine contains 360 coolant tubes.

With four RS-25 engines on the SLS core stage and four RL-10 engines on the Exploration Upper Stage, a whopping 9 miles of tubing will be used to support each SLS Block 1B launch.



SLS GOES TO THE ALABAMA CAPITOL

The 30-foot inflatable SLS and the RS-25 engine (not pictured) lined Washington Street on March 10 for NASA Day at the Alabama State House in Montgomery. The annual event recognizes NASA and the state's enduring relationship with the space agency. NASA team members also visited Montgomery-area schools and the W.A. Gayle Planetarium in Montgomery, engaging students in science, technology, engineering and math activities.

SLS MANAGER JOHN HONEYCUTT TALKS ROCKETS IN DECATUR

SLS Program Manager John Honeycutt talks about progress on the rocket and NASA's journey to Mars on March 7 with some 120 members of the Decatur Rotary Club of Decatur, Alabama.



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COMING IN APRIL:

Launch vehicle stage adapter structural test article welding complete

EM-1 booster aft segment cast

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